CLAIMS

WHAT IS CLAIMED IS:

1. A viscous damper comprising:

first and second components defining an enclosed chamber for holding damping fluid;

a rotor having a first portion rotationally disposed in said chamber and a second portion extending outwardly from said chamber;

a valve disposed in said chamber for relative rotation with respect to said rotor; and

said rotor and said valve each having at least one valve face complementary to each other, said faces adapted for engaging each other and substantially closing a space therebetween when said rotor is rotated in a first direction and for relative rotation with respect to each other for opening a space therebetween when said rotor is rotated in a second direction.

2. The damper of claim 1, said valve including a base and an outwardly extending wing, with said valve face of said valve disposed on said wing.

3. The damper of claim 2, said rotor including an outwardly extending paddle and said valve face of said rotor disposed on an end of said paddle adjacent said wing.

4. The damper of claim 3, said valve base being annular, and said rotor including a pin extending through said annular base.

5. The damper of claim 4, said rotor including an abutment positioned to engage said valve and limit relative rotation between said valve and said rotor.

6. The damper of claim 4, said valve including two said wings and a valve face on each said wing; and said rotor including two said paddles and a valve face on each said paddle.

7. The damper of claim 6, said rotor including an abutment positioned to engage said valve and limit relative rotation between said valve and said rotor.

8. The damper of claim 1, said chamber having an inwardly projecting rib and said rotor including a rotor flange above said rib, said rotor flange having an angular inner surface, said rib and said rotor flange defining a space therebetween of varying dimension with relative rotation between said rotor and said housing.

9. The damper of claim 8, said chamber having two said ribs and said rotor including a rotor flange above both said ribs, said rotor flange having an angular inner surface above each said rib, said ribs and said rotor flange defining spaces therebetween of varying dimension with relative rotation between said rotor and said housing.

10. A damper comprising:

a housing having an opening;

a cover over said opening;

a rotor rotatably disposed in said housing, said rotor extending outwardly of said housing through said cover;

a seal between said cover and said rotor; and

a v-shaped channel in one of said housing and said cover and a ring in the other of said housing and said cover, said channel having walls defining said channel, and said ring being rectangular in cross-section and including edges received against said walls.

11. The damper of claim 10, said ring disposed on said cover and said channel disposed in said housing.

12. The damper of claim 10, said housing including a substantially cylindrical wall, and said cover including a flange slidable into said housing along said cylindrical wall.

13. The damper of claim 12 said ring disposed on said cover and said channel disposed in said housing.

14. The damper of claim 13, including an O-ring on said rotor, between said rotor and one of said components.

15. The damper of claim 10, said cover ultrasonically welded to said housing along said ring edges received against said channel walls.

16. The damper of claim 10, said rotor including an end, and said housing including a base defining a depression, said end of said rotor being disposed in said depression in said base.

17. A method for assembling a damper comprising steps of:

providing a damper housing defining a chamber with an opening, the housing defining surface at an end thereof;

providing a cover for the opening, the cover having an annular surface;

providing a rotor having a first portion for rotation in the chamber and a second portion for extending outwardly of the housing;

providing a fluid seal on the rotor;

placing the first portion of the rotor in the chamber;

sliding the cover onto the second portion of the rotor and positioning the cover against the seal and against the housing;

centering the annular surface of the cover on the end surface of the housing; and

welding the cover to the housing along at least one continuous bead defined at the contact between the annular surface of the cover and the end surface of the housing.

18. The method of claim 17, wherein the end surface of the housing defines a v-shaped channel, and the annular surface of the cover defines an annular ring being rectangular in cross-section, such that the centering step includes centering the ring in the channel, with edges of the ring against walls of the channel, and such that the welding step includes welding the cover to the housing along substantially continuous bead defines at the contact between edges of the ring and walls of the channel.

19. The method of claim 18, including:

providing an annular flange on the cover inwardly of the ring; and

sliding the flange into the housing while centering the ring in the channel.

20. The method of claim 19, including:

providing a depression in a bottom of the chamber and a pin on the rotor to be received in the depression; and

positioning the pin in the depression while sliding the flange in the housing and centering the ring in the channel.

21. The method of claim 17, including dispensing damping fluid into the chamber.